

App. No. 10/065,552
Amendment dated March 3, 2005
Reply to Office action of December 3, 2004

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the present application.

Listing of Claims:

Claim 1 (currently amended): A method for non-invasively profiling, using the C/V technique, carrier concentration in a wafer including [[an]] a plurality of In-containing-compound semiconductor surface layer layers, wherein the carrier concentration profiling method includes:

contacting a liquid electrode superficially on the wafer; and
employing [[an]] applied voltage being up to voltages, including at least a maximum voltage surpassing that surpasses 10V, to profile the wafer's C/V characteristics without using photo-etching.

Claim 2 (original): The carrier concentration profiling method set forth in claim 1, wherein an aqueous EDTA solution is utilized as the liquid electrode.

Claim 3 (original): The carrier concentration profiling method set forth in claim 2, wherein the aqueous EDTA solution contains 80% or more EDTA.

Claim 4 (original): The carrier concentration profiling method set forth in claim 1, wherein liquid tiron is utilized as the liquid electrode.

Claim 5 (original): The carrier concentration profiling method set forth in claim 1, wherein a metal Ga melt is utilized as the liquid electrode.

Claim 6 (currently amended): A method for profiling, using the C/V technique, carrier concentration in a wafer including [[an]] a plurality of In-

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containing-compound semiconductor surface layer layers, wherein the carrier concentration profiling method includes:

superficially contacting the wafer with and thereafter solidifying a metal Ga melt, to form a metal Ga electrode;

employing ~~[[an]] applied voltage being up to voltages, including at least a maximum voltage surpassing that surpasses~~ 10V, to profile the wafer's carrier concentration; and

subsequent to the profiling, melt-clearing the metal Ga electrode.

Claim 7 (withdrawn): A compound semiconductor wafer including an In-containing-compound semiconductor surface layer, wherein carrier concentration in the wafer is non-invasively profiled, whereby its carrier concentration having been non-invasively profiled the wafer can be employed as it is for device processing.

Claim 8 (withdrawn): A compound semiconductor wafer including an In-containing-compound semiconductor surface layer, wherein carrier concentration in the wafer is non-invasively profiled according to the method set forth in claim 1, whereby its carrier concentration having been non-invasively profiled the wafer can be employed as it is for device processing.

Claim 9 (withdrawn): A compound semiconductor wafer including an In-containing-compound semiconductor surface layer, wherein carrier concentration in the wafer is non-invasively profiled according to the method set forth in claim 2, whereby its carrier concentration having been non-invasively profiled the wafer can be employed as it is for device processing.

Claim 10 (withdrawn): A compound semiconductor wafer including an In-containing-compound semiconductor surface layer, wherein carrier concentration in the wafer is non-invasively profiled according to the method set forth in claim 3,

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whereby its carrier concentration having been non-invasively profiled the wafer can be employed as it is for device processing.

Claim 11 (withdrawn): A compound semiconductor wafer including an In-containing-compound semiconductor surface layer, wherein carrier concentration in the wafer is non-invasively profiled according to the method set forth in claim 4, whereby its carrier concentration having been non-invasively profiled the wafer can be employed as it is for device processing.

Claim 12 (withdrawn): A compound semiconductor wafer including an In-containing-compound semiconductor surface layer, wherein carrier concentration in the wafer is non-invasively profiled according to the method set forth in claim 5, whereby its carrier concentration having been non-invasively profiled the wafer can be employed as it is for device processing.

Claim 13 (withdrawn): A compound semiconductor wafer including an In-containing-compound semiconductor surface layer, wherein carrier concentration in the wafer is non-invasively profiled according to the method set forth in claim 6, whereby its carrier concentration having been non-invasively profiled the wafer can be employed as it is for device processing.

Claim 14 (new): A method utilizing a C/V analyzer including a light-receiving-windowless cell to profile non-invasively, without using photo-etching, carrier concentration in a semiconductor substrate composed of an In-containing compound and superficially onto which at least one In-containing-compound semiconductor layer has been heteroepitaxially grown, the method consisting essentially of the steps of:

filling the cell with one liquid selected from an aqueous EDTA solution containing 80% or more EDTA, liquid tiron, and a metal Ga melt;

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placing the wafer on an opening in the cell so as to put the liquid in superficial contact with the wafer to allow the liquid to function as an electrode; and

employing applied voltages, including at least a maximum voltage that surpasses 10V, to profile the wafer's C/V characteristics.